period of secular elevation, accompanied by faulting on an extensive scale. Gradual uprise of the land was continued practically into modern times." An epoch of extensive glaciation, with the formation of an ice-sheet in the basin of Boulder Lake, then opened in Pliocene or post-Pliocene times (p. 22). Especial attention is directed in this bulletin to the immense deposits of limonite iron-ore associated in the district with an ancient series of carbonate rocks. The ore is ascribed to the decay of iron pyrites, and to the reaction of the resulting ferrous sulphate on the carbonates. The ferrous carbonate has finally been altered to limonite, probably as a surface-phenomenon; but the resulting ores occur on a vast scale, highly encouraging for their future prospects (pp. 75–88).

The Bureau of Science of the Government of the Philippine Islands is responsible for the admirably produced *Philippine Journal of Science,* an example to our Government printers in India, or perhaps an example of the disparity of the funds officially devoted in the two countries to scientific publications. In vol. ii., No. 4 (Manila, August, 1907), Mr. A. J. Eveland describes the geology and geography of the Baguio mineral district. Here again, in the island of Luzon, we find an old crystalline basis, marine Eocene (?) and Miocene beds laid down upon it, and then an epoch of elevation and denudation. The Miocene limestone is cut through by the present Bued River valley, which reaches down to the basal diorite (Fig. 2). G. A. J. C.

ARCHÆOLOGY IN AMERICA.[1]

THE first part of the second volume of the Transactions of the University of Pennsylvania's Department of Archæology, Free Museum of Science and Art (it is a pity that this cumbrous title cannot be simplified), contains the usual instalment of articles on Cretan and Mexican archæology, with interesting contributions by Mr. G. B. Gordon on the western Eskimo of Alaska and on an engraved bone from Ohio, the decoration of which is very Mexican in character. The author of the article on Mexican archæology, Miss Adela Breton, draws interesting analogies between the Mexican conventional representations of serpents and the dragons of Chino-Japanese art. There certainly seems to be some connection, however it may be explained. The explanation, when it arrives, will, however, be a genuine one, and not on the lines of the late Mr. Donnelly's "Atlantis," with its curious comparisons of Maya signs with "Egyptian hieroglyphics," most of which had no real existence. It is a pity that the investigation of possible connections between Mexican culture and those of the rest of the world has been so seriously discredited by the "Atlantis" idea. Miss Breton's description of the Xochicalco temple is interesting reading.

Mr. Gordon describes, among other "ploys" of the Eskimo, their elaborate cat's-cradle games. From a personal trial we cannot say that his recipes for their production are as clearly put as they might be. The photographs of these Eskimo which Mr. Gordon publishes show a Mongol rather than American type; plate v., 2, might, but for the eyes being rather too deeply set, be a Japanese.

The Cretan contribution is a good article on "The Decorative Art of Crete in the Bronze Age," by Miss Edith H. Hall, who worked at Gournià with Miss Boyd (Mrs. Hawes). As a succinct description of the most striking characteristics of the succeeding "Minoan" periods of Cretan artistic development it is very useful, and supplements Dr. Evans's "Essai de Classification" and Dr. Mackenzie's articles on pottery in the "Journal of Hellenic Studies" and the "Annals of the British School at Athens." In tone Miss Hall is perhaps just a trifle too dogmatic, and dismisses the opinions of others (*e.g.* Messrs. Hogarth and Welch once or twice) too summarily. On Egyptian matters, too, she is inclined to regard as certain what those who deal with Egyptian things at first-hand know to be thoroughly uncertain. The later system of Egyptian dates is adopted (p. 12) from Prof. Breasted's history with hardly a qualm, in spite of the fact that it is not yet accepted by Petrie, Maspero, von Bissing, or Budge (to give only the most prominent names). There are growing reasons in favour of it, true; but equally there are most serious considerations to be urged against it. To talk dogmatically of the VIth Dynasty as ending "*in* 2475 B.C." (the italics are mine), or the XIIth as dating "from 2000 to 1788 B.C.," is absurd, though Miss Hall is not responsible for the absurdity.

Also, Miss Hall makes the usual mistake of the Greek archæologist, a mistake which we had occasion to correct in the case of her colleague Mr. Seager last year, in persistently regarding all Egyptian representations of plants, flowers, and so forth, as stiff and conventional. They are not invariably so, as a study of plant designs on XVIIIth Dynasty pottery from Deir el-Bahari and elsewhere shows; it is these, and not the formal dadoes of papyrus plants in wall paintings, that we must compare with the plant designs of the Cretan artists. Miss Hall's Fig. 29 is quoted as a Cretan "adaptation of the lotus clumps of Egyptian art. Here the method of arranging the flowers," she says, "is the same as in Egyptian art, yet every trace of Egyptian stiffness is gone." I could quote several examples of Egyptian representations of flowers that are far less stiff and formal than this Cretan one. The designs of Figs. 35, 48, and 49 could all be paralleled on Egyptian pottery.

Miss Hall's classificatory table of "Cretan Bronze Age Design" is very useful as a conspectus of the chief examples of the designs of the "Minoan" periods.

H. R. HALL.

THE PELYCOSAURIAN REPTILES.[1]

ALMOST exactly thirty years ago the late Prof. Cope brought to the notice of the scientific world remains of certain remarkable carnivorous reptiles from the Permian strata of Texas, for which he proposed the group-name Pelycosauria. The group was regarded as a suborder of the Rhynchocephalia, and was provisionally taken to include the theriodont reptiles of South Africa. Among the more typical representatives of the pelycosaurs are Dimetrodon and Naosaurus, extraordinary reptiles in which the dorsal spines of the trunk vertebræ are so enormously elongated (sometimes with the addition of transverse projections) that they exceed in height the depth of the body below them. Restorations of both the skeleton and the external form have now rendered these creatures familiar even to the man in the street.

As to the systematic position of these reptiles and their kindred, considerable diversity of view has obtained. By many writers they are classed with the theriodont anomodonts, but this, according to modern ideas, is altogether unjustifiable, the structure of the temporal arches in the two groups being different. Dr. Case therefore reverts to the original view that pelycosaurs form a primitive section of the rhynchocephalians.

The group is of special interest as illustrating, perhaps better than any other, the rapid evolution from a generalised type to a complex organisation that may have been the potential cause of early extinction, the life of these reptiles being coterminous with the duration of the Permian epoch. Why these specialised structures were evolved within such a comparatively short time is a subject upon which we can only conjecture. Carnivorous in habit, and easily masters of their contemporaries, these reptiles, Mr. Case suggests, may have developed their spines from mere exuberance of growth from a utilitarian beginning, but that these structures eventually became useless cannot be doubted.

That pelycosaurs existed outside of North America is proved by the occurrence of Naosaurus in the Permian of Bohemia and of Stereorhachis in that of France, while certain reptiles from central Germany may also belong to the group. On the other hand, they are unknown in South

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[1] University of Pennsylvania: Transactions of the Department of Archæology, Free Museum of Science and Art, vol. ii., part i. Pp. 105; 29 plates. (Philadelphia: Published by the Department of Archæology, 1906.) Price 1 dollar.

[1] "Revision of the Pelycosauria of North America." By E. C. Case. Publication No. 55. Pp. 176+35 plates. (Carnegie Institution, Washington, D.C., 1907.)

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Africa or India, and it is improbable that they are represented in the Russian Permian. If this be so, pelycosaurs are unknown in any country where anomodonts (in the wider sense of that term) occur, so that the two groups may apparently be regarded as belonging to totally distinct faunas.

Dr. Case appears to have done his work very thoroughly, and the memoir is profusely illustrated. Before, however, expressing an opinion as to whether his restorations of cranial, and especially palatal, osteology are trustworthy, it would be essential to compare the original specimens with the figures. R. L.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

BY the will of Sir William G. Pearce, Bart., chairman of the Fairfield Shipbuilding and Engineering Co., Ltd., who died on November 2, Trinity College, Cambridge, will benefit to the extent of more than 400,000*l.* upon the death of Lady Pearce, should he have left no child.

THE joint matriculation board which directs and controls the matriculation examination of the universities of Leeds, Liverpool, Manchester, and Sheffield has issued its report for the year 1907. The number of candidates in July was 1,294, of whom 705 passed; and in September was 438, of whom 179 passed. The board has appointed a committee to draft a scheme for the inspection and examination of schools, and it has been assured by the universities of their general approval of the objects of the proposal.

A CONFERENCE of teachers, arranged by the London County Council, will be held at the Medical Examination Hall, Victoria Embankment, London, on January 2, 3, and 4. Two meetings will be held each day, and begin at 11 a.m. and 2 p.m. The subject for the first meeting will be nature-study, and addresses will be delivered by Dr. T. P. Nunn and Messrs. H. E. Turner and J. T. Winkworth. At the second meeting the teaching of botany will be discussed, and the speakers will include Miss Lulham, Miss Lilian Clarke, and Miss von Wyss. At the fifth meeting, manual work in the lower standards of elementary schools will be considered, and Dr. Slaughter and Messrs. J. C. Hudson and P. B. Ballard will speak. At the last meeting Mr. W. J. Hazlitt will read a paper on open-air geography. Applications for tickets of admission should be made to Dr. Kimmins, Education Department of the London County Council, Victoria Embankment, W.C.

THE annual meeting of public school science masters will be held at Westminster School on January 14, 1908. The meeting will commence at 10 a.m., when an exhibition of scientific apparatus will be opened. During the morning the president, Prof. H. A. Miers, F.R.S., will deliver an address upon the order in which science subjects should be taught (*a*) in public schools, (*b*) at the universities. In the morning also a discussion on teaching mechanics will be opened by papers on the educational value of mechanics by Mr. C. F. Mott, of Giggleswick School, and on the teaching of practical mathematics by Mr. H. Wilkinson, of Durham School. In the afternoon a discussion on teaching physics will take place, when papers will be read by Mr. C. Cumming, of Rugby School, on a scheme of laboratory work in physics; Mr. W. E. Cross, of Whitgift Grammar School, on a suitable curriculum for the first and second years; and Mr. J. M. Wadmore, of Oldenham School, on the compulsory teaching of elementary physics to junior forms.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, December 5.—"On the Distribution of the Different Arteries supplying the Human Brain." By Dr. C. E. **Beevor.** Communicated by Prof. David Ferrier, F.R.S.

The area of distribution of the different arteries of the brain was ascertained, when they were injected simultaneously under the same pressure with gelatin containing soluble colours, a method not used before.

The number of brains injected was eighty-seven. The arteries injected were the posterior communicating, the anterior choroid, the anterior cerebral, the middle cerebral, and the posterior cerebral.

The *method of investigation* consisted in injecting simultaneously by means of pressure bottles, three, four, or five of these arteries with different soluble colours. The injection mass used was gelatin, coloured with soluble carmine, Nicholson's blue, naphthol green, acridine yellow, and Bismarck brown. Twelve different classes of experiments were described. The brains were hardened in formalin, and subsequently cut and examined in the sagittal, horizontal, or coronal planes.

The parts of the brain, the arterial supply of which hitherto has not been described, or which was found to be different from that described by other observers, are:—

The regio subthalamica, with the corpus subthalamicum and Forel's field; the pes pedunculi; the corpus mammillare; the anterior limb of the internal capsule; the caudate and lenticular nuclei; the different nuclei of the optic thalamus (the thalamus is not supplied by the lenticulo-optic arteries of Duret); the anterior part of the choroid membrane, which is supplied by the anterior choroid artery; the fornix and the anterior commissure. The absence of anastomoses of the three arteries supplying the posterior limb of the internal capsule and of the two arteries to the head of the caudate nucleus was also noted.

In the cortex, the anterior cerebral area extends on the outer surface along the median line posteriorly, most frequently to mid-way between the Rolandic fissure and the external parieto-occipital fissure, and inferiorly to the sulcus frontalis superior. The middle cerebral area on the outer surface reaches the middle line for the posterior half of the parietal lobe, and posteriorly the posterior pole, or half an inch in front of it, and inferiorly the middle of the third temporal gyrus. The occipital fibres of the optic radiations in the superior lip of the calcarine fissure are usually supplied by the middle cerebral artery, and in the inferior lip by the posterior cerebral, except for about the posterior inch, which is supplied entirely by the posterior cerebral.

The knowledge of the exact part of the brain which is supplied by an artery is of great importance in the diagnosis of the parts of the brain which undergo softening when this particular artery is blocked by a blood clot.

"The Influence of Increased Barometric Pressure on Man. No. 4. The Relation of Age and Body Weight to Decompression Effects." By Leonard **Hill,** F.R.S., and M. **Greenwood,** jun.

Conclusions.—(1) Small mammals are relatively immune from decompression effects.

(2) This immunity depends on rapidity of circulation, and may be destroyed by damaging the latter with chloroform.

(3) Age is probably important *per se*, but of far less importance than body weight. We have no convincing proof that two animals of the same weight but different ages would exhibit unequal resisting powers.

(4) There is no evidence that small animals are more quickly poisoned by high pressures of oxygen than large ones.

The practical outcome of this research is that young men of small body weight and possessing a vigorous circulation should be selected for compressed air works.

Royal Meteorological Society, November 20.—Dr. H. R. Mill, president, in the chair.—Reports on the results obtained by the balloon observations made in the British Isles, July 22–27. The International Aëronautical Commission has for some years set apart the first Thursday in each month for the ascent of kites and balloons, but at last year's conference it was decided to make a special effort to obtain information on a series of consecutive days, and the last week in July was finally decided upon for the purpose. Twenty-five balloons with registering instruments were sent up in England and Scotland during the week, under the direction of Mr. W. H. Dines, at Pyrton

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